

# SERIES 'F' MAGNETIC COUPLED SEAL-LESS PUMP & MOTOR UNIT



MATERIAL	MODELS	
Polypropylene	2 x 2 MPGC	3 x 2 MPGC
PVDF	2 x 2 MKGC	3 x 2 MKGC

Refer to Bulletin P-621 and  
Parts List P-4075.

## SAFETY PRECAUTIONS BEFORE STARTING PUMP

1. Read operating instructions and instructions supplied with chemicals to be used.
2. Refer to chemical resistance data chart for compatibility of materials with solution to be used.
3. Note temperature and pressure limitations.
4. Personnel operating pump should always wear suitable protective clothing: face mask or goggles, apron and gloves.
5. All piping must be supported and aligned independently of the pump.
6. Always close valves slowly to avoid hydraulic shock.
7. Ensure that all fittings and connections are properly tightened.

## BEFORE CHANGING APPLICATION OR PERFORMING MAINTENANCE

1. Wear protective clothing as described in Item 4 of Safety Precautions above.
2. Flush pump thoroughly with a neutralizing solution to prevent possible harm to personnel.
3. Shut off power to motor at disconnect switch.

## ASSEMBLY

Unpack pump from carton and check for shipping damage.

## PUMPS WITH MOTORS

Remove shipping plugs and inserts from suction and discharge, and proceed to installation instructions.

## PUMPS WITHOUT MOTORS

1. Remove wet end assembly from box.
2. Remove hardware package from box.
3. Install motor adapter (Item 6) onto motor with labels at top using Items 10 and 11.
4. Remove drive magnet assembly (Item 5) from box and slide assembly onto motor shaft making sure shaft key (Item 12) is in place. Installation dimension is  $.060 \pm .010$  inches as shown in Figure 1. Tighten 2 set screws, Item 5A.

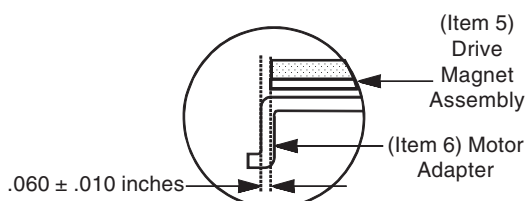


Figure 1

**IMPORTANT:** Verify the tightness of the set screws in the drive magnet assembly prior to operation.

5. Remove shipping caps and inserts from suction and discharge of the wet end assembly, and install onto the motor adapter.

**WARNING:** Components can slam together from strong magnets. Keep fingers away from area between housing and motor adapter.

6. Install 5/16 x 3/4 SS hex bolts (Item 7), 5/16 flat washers (Item 8), and 5/16 hex nuts (Item 9) making sure discharge is in correct location. Tighten bolts to 60-75 in/lbs of torque using pattern shown in Figure 2.
7. Reach into suction and check to see if impeller rotates freely. If it does not, disassemble and recheck drive installation instructions in step 4.
8. Install pump into system according to installation instruction below.

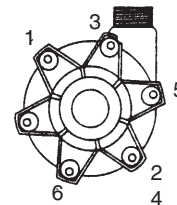


Figure 2

## INSTALLATION MOUNTING

Motor or base plate should be securely fastened.

## PIPING

1. Support piping near pump to minimize strain on pump casings.
2. To minimize head loss due to friction:
  - a. Increase discharge pipe size 1 diameter
  - b. Use minimal number of bends
3. Keep pipe bends a minimum of 10 pipe diameters from suction and discharge. For example, if using 2" pipe, first bend should be at least 20" from suction discharge.
4. Position pump as close to liquid source as possible.
5. Maintain flooded suction.
6. Ensure that piping is leak proof.
7. Install valves on suction and discharge lines (a minimum of 10 pipe diameters from pump).

**IMPORTANT:** Considerable damage will result from the rapid temperature rise which will occur if the pump is run against a closed discharge valve.

8. For units in a suction lift system, install appropriate piping in the discharge to allow priming of pump.
9. The suction valve should be fully open to avoid restricting suction flow.

**! IMPORTANT:** To protect the pump if prime is lost, use one of the following: (1) pressure switch on the discharge; (2) vacuum switch on the suction; (3) a motor minder to monitor motor current.

- When pumping liquids which may solidify or crystallize, a flush system should be added to the piping. See Figure (3). Install water inlet and outlet valves as shown.

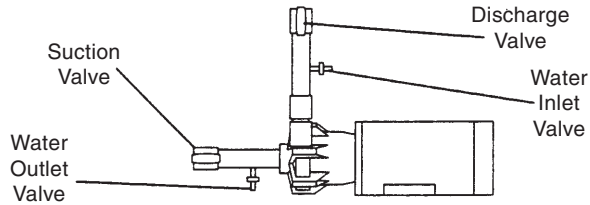


Figure 3

### ELECTRICAL

Install motor according to NEC requirements and local electrical codes.

**! IMPORTANT:** Before operating the pump, jog the motor to verify correct rotation (clock-wise as viewed from the motor fan - refer to directional arrow on pump).

### OPERATION

#### FLOODED SUCTION SYSTEM

- Fully open suction and discharge valves.
- Start the pump and check liquid flow. If no flow, refer to TROUBLE SHOOTING section.
- Adjust flow rate and pressure by regulating discharge valve. **Do not attempt to adjust flow with the suction valve.**

#### SUCTION LIFT SYSTEM

- Fully open suction and discharge valves.
- Prime system by filling priming chamber. Allow time for trapped air in suction line to work its way out.
- Start the pump. Set liquid flow rate and pressure by regulating discharge valve. **Do not attempt to adjust flow with the suction valve.**

#### FLUSH SYSTEM

- Fully close suction and discharge valves.
- Connect water supply to water inlet valve.
- Connect drain hose to water outlet valve.
- Open inlet and outlet valves and flush system until pump is clean (approximately 5 minutes).

### MAINTENANCE

#### DISASSEMBLY

- Disconnect power. Remove electrical wiring and mounting bolts to floor or base plate.
- Close suction and discharge valves, and disconnect piping.
- Remove bolts, nuts and washers (Item 7, 8 and 9). Leave the 2 housing studs (Item 16) in place until the wet end is removed.
- Securely clamp or hold motor in place. Remove wet end assembly by inserting both thumbs into pump suction and pulling assembly straight out with a quick motion.

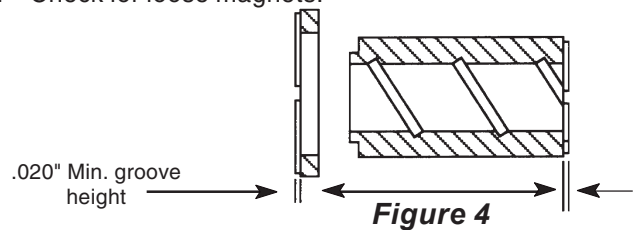
**! WARNING:**  
Components can slam together from strong magnets. Keep fingers away from area between housing and motor adapter

- Disassemble wet end by removing 2 housing studs and nuts (Items 17) which attach liner assembly (Item 4) to impeller housing (Item 1). Remove and discard "O"-ring (Item 13).
- Remove drive magnet assembly by inserting a 3/16" hex wrench into access hole in side of motor adapter and loosening 2 set screws (Item 5A). Grasp inside of magnet assembly and pull off of motor shaft.

**! CAUTION:**  
Strong magnets present. Keep metal objects and metallic chips/particles away from pump components.

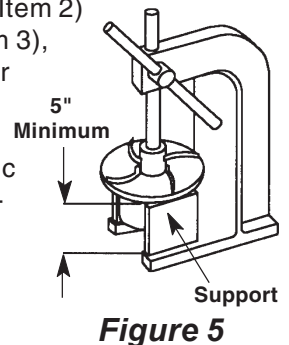
#### EXAMINATION

- Check impeller drive bushing (Item 3A), and impeller thrust ring (Item 2A). If cracked, chipped or scored, then replace. If minimum groove height is less than the minimum height recommended, then replace. See Figure 4.
- Check for loose magnets.



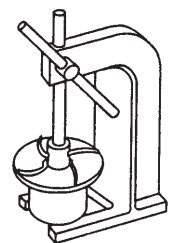
#### IMPELLER DISASSEMBLY

- To separate impeller body (Item 2) from the impeller drive (Item 3), support the body in an arbor press using two 5" minimum spacer blocks.
- Insert a 1 1/2" diameter plastic or wooden shaft into the impeller eye and push the drive out of the body. See Figure 5.



#### BUSHING AND THRUST RING REPLACEMENT

- To remove the bushing, place the impeller assembly (Items 2 and 3) in an arbor press. Insert a 1" diameter plastic or wooden shaft through the impeller and press bushing out. Refer to Figure 6.
- To replace the bushing, place the impeller assembly (Items 2 and 3) on a flat surface with the thrust ring face down (Item 2A). Insert the bushing (Item 3A), slotted face out, into impeller assembly. Gently push until bushing bottoms out. Bushing should be flush with impeller eye.
- Impeller thrust ring (Item 2A) can be removed from impeller body (Item 2) by gently pulling the ring from impeller nose.
- To replace the thrust ring, align ring (grooved side up) with the inside of the impeller assembly (Item 2), and press into place.  
NOTE: Protect face with wood or plastic and avoid tilting of the ring.



## REASSEMBLY

1. Insert impeller assembly (Items 2 and 3) into liner assembly (Item 4). Make sure impeller is free of metal chips. Install new "O"-ring (Item 13) onto lip of liner assembly (Item 4).
2. Install impeller housing (Item 1) onto liner assembly (Item 4). Insert 2 housing studs and washers (Items 16 and 17) long end into back of liner assembly (Item 4) and push through the impeller housing (Item 1) until threads are exposed. Install nut and washer (Item 8 and 9) and tighten. On the other end of the stud, you will find athreaded housing nut (Item 17). This nut can be tightened using pliers or a crescent wrench. It is important to leave about  $\frac{3}{4}$ " of thread exposed so nuts and washers can be installed on motor adapter side.
3. Complete reassembly following steps 5, 6, 7 and 8 of "Pumps without Motors" section on Page 1 of these instructions.

**CAUTION:** If item numbers 14, 9 and 8 are removed from the motor adapter (Item 6), it is very important to place a small amount of "Loc-Tite" removable thread locker-242 onto the threads of the socket head cap screw (Item 14) before installing back into the nut (Item 9). The above procedure is only necessary for the U.S. adapters 184 TC and 213 TC and prevents the parts from working loose during normal operation. Failure to comply may cause damage to the pump!

## TROUBLESHOOTING

### NO FLOW

1. Pump not primed
2. Discharge head too high. Insufficient NPSH.
3. Suction lift too high.
4. Closed valve.
5. Viscosity too high (magnets uncoupled).

### INSUFFICIENT DISCHARGE

1. Air leaks in suction piping.
2. Discharge head higher than anticipated.
3. Suction lift too high or insufficient NPSH. Check also for clogged suction line or clogged foot valve.
4. Foot valve too small.
5. Foot valve or suction open or not submerged enough.

### INSUFFICIENT PRESSURE

1. Air or gasses in liquid.
2. Impeller diameter too small.
3. Discharge head higher than anticipated.

### LOSS OF PRIME

1. Leaking suction line.
2. Suction lift too high or insufficient NPSH
3. Air or gasses in liquid.
4. Foreign matter in impeller.
5. Leaking foot valve.

### EXCESSIVE POWER CONSUMPTION

1. Head lower than rating. Pumps too much liquid.
2. Specific gravity or viscosity of liquid pumped is too high or higher than that defined in application.

### VIBRATION

1. Excess bearing wear.
2. Drive magnet uncoupled.
3. Loose magnet.
4. Pump cavitating.



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2900 MacArthur Blvd. 847-509-2900  
Northbrook, IL 60062-2005 U.S.A. 800-323-5431  
e-mail: sales@serfilco.com FAX: 847-559-1995  
www.serfilco.com